Space Weather Forecast

Issued on Friday, 22 December 2023 at 12:57 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of isolated Moderate flares throughout.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Moderate with a Moderate-class flare peaking at 22/0004 UTC from a region in the southwest quadrant. This region has been the main source of recent flare activity, but is now approaching the southwest limb and as such is becoming difficult to analyse. There are currently five regions on the disc which are of reasonable size, but none have significant magnetic complexity. There are a further five regions which are all small and simple at present.
The Moderate-class flare produced a Coronal Mass Ejection (CME), which has been assessed as non Earth directed. No further Earth directed CMEs have been seen in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds have been at background levels through the last 24 hours. Wind speeds varied between 320-380 km/s. Total magnetic field strength has been weak, with the north-south component also varying weakly. Total geomagnetic activity has been Quiet (Kp 0-1) throughout.

Energetic Particles / Solar Radiation: High energy proton flux has been at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Low activity is expected, with a continued chance of Moderate-class flaring, mainly from the region near the southwest limb. As this region rotates off the disc on Day 2 (23 Dec), the risk reduces a little for Days 3 and 4 (24-25 Dec).

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs are currently expected. The solar wind is currently at background levels. A coronal hole fast wind may then connect with the Earth today (22 Dec), but this is now considered unlikely to occur. If it does it is likely to be weak, with wind speeds potentially reaching 400-450 km/s before declining again through Day 3 (24 Dec). Geomagnetic activity is expected to remain largely Quiet to Unsettled (Kp 0-3) during the period. There is a slight chance of Active (Kp 4) intervals, should any connection to the fast wind occur today.

Energetic Particles / Solar Radiation: Solar radiation is currently at background levels, with just a slight chance of solar radiation storms, should there be any larger flares on the western side of the disc.

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Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	30	30
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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